1. A test apparatus comprising:

a trolley restricted from movement in a lateral direction by lateral restraints;

a load applicator in communication with the trolley configured impart a load through the trolley along a load axis, said load axis perpendicular to the lateral direction;

mating surfaces comprised of a contact face and a receiving face, said contact face connected to the trolley;

a spherical bearing intermediate the contact face and the receiving face;

a rotary actuator coupled to the spherical bearing imparting oscillating rotary motion to the spherical bearing upon command along a rotation axis;

a load sensor configured to sense a load along the load axis;

a torque sensor configured to sense a torque along the rotation axis; and

a processor in communication with the load sensor and torque sensor, said processor providing a coefficient of friction substantially in real time.

2. The test apparatus of claim 1 further comprising a position sensor configured to sense a relative position of the spherical bearing as it is rotated about the rotation axis by the rotary actuator.

3. The test apparatus of claim 1 wherein the position sensor is in communication with the processor and the processor calculates a cycles per second value for the oscillating rotation of the spherical bearing.

4. The test apparatus of claim 1 further comprising one of a lubricant and a material applied to one of the spherical bearing, the contact face and the receiving face.

5. The test apparatus of claim 1 further comprising a controlled environment providing one of a temperature intermediate about -320 F. to about a 1,000 F., a humidity intermediate 0 to 100%, a predetermined vacuum, and a predetermined atomic oxygen content, said controlled environment provided at least about the spherical bearing.

6. The test apparatus of claim 1 wherein the rotary actuator is coupled with a Schmidt type coupler to the spherical bearing.

7. The test apparatus of claim 1 wherein the spherical bearing is fixedly connected to a shaft coupled to the rotary actuator.

8. The test apparatus of claim 1 wherein the rotary actuator is hydraulically actuated and controlled by a servo motor in communication with a servo controller, and

said servo controller receives a signal from a controller.

9. The test apparatus of claim 8 wherein the controller is in communication with the processor.

10. The test apparatus of claim 8 wherein the controller is a Fluke Helios II.

11. The test apparatus of claim 8 wherein the controller is also in communication with a servo controller which provides a signal to a servo motor in hydraulic fluid communication with the load applicator.

12. The test apparatus of claim 11 wherein the load applicator is hydraulically operated and comprises a hydraulic cylinder which extends a piston which is communicates an applied load through the trolley to the spherical bearing.

13. The test apparatus of claim 1 wherein the processor provides the command to rotate the spherical bearing in rotary oscillating motion.

14. The test apparatus of claim 1 wherein the processor also provides commands to apply load through the load applicator to the spherical bearing.

15. A test apparatus comprising:

a trolley;

a load applicator in communication with the trolley configured impart a load through the trolley along a load axis;

mating surfaces comprised of a contact face and a receiving face, said contact face connected to the trolley;

a spherical bearing intermediate the contact face and the receiving face;

a rotary actuator coupled to the spherical bearing by a shaft, said rotary actuator imparting oscillating rotary motion to the spherical bearing upon command along a rotation axis;

a load sensor configured to sense a load along the load axis;

a position sensor configured to sense a relative position of the spherical bearing as it is rotated about the rotation axis by the rotary actuator; and

a processor in communication with the position sensor, said processor providing a cyclic rate of oscillating rotation of the spherical bearing in substantially real time.

16. The test apparatus of claim 15 wherein the trolley is restricted from movement perpendicularly to the load axis by lateral restraints.

17. The test apparatus of claim 15 further comprising a torque meter configured to sense a torque of the shaft, and provide an input to the processor, said processor also calculating a coefficient of friction in substantially real time.

18. The test apparatus of claim 15 further comprising one of a lubricant and a material in contact with one of the spherical bearing, contact face and receiving face.

19. The test apparatus of claim 15 wherein the rotary actuator and load applicator are hydraulically actuated.

20. The test apparatus of claim 15 further comprising a controlled environment about at least the spherical bearing, said controlled environment having at least one of a predetermined temperature, humidity, pressure, and oxygen content.